ABSTRACT

A transmitted signal's higher order statistics of temporally dependent waveforms are exploited to geolocate low power signals. The geolocation is independent of the characteristics or encoded data of the transmitted waveform. The method uses spatial fourth order cumulants or spatial second order moments in a Blind Source Separation and generalized eigenvalue decomposition to determine unique matrix pencil eigenvalues and eigenvectors. The eigenvectors provide are orthogonal to the steering vector of the transmitted signal save one, which represents the steering vector. This property is used to determine Steering vectors, AoA or geolocation. The receiver includes a multi-element array and does not need a priori knowledge of the transmitted signal source to geolocate the target transmitter. The methods and apparatus for geolocation does not require typical demodulation.

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